

HARMONIC FORCE GENERATOR FOR AN ACTIVE VIBRATION CONTROL SYSTEM
Applicant: Kirk Charles Frederickson; Attorney docket: 67,008-076; S-5656
Express Mail No. EV221422530US

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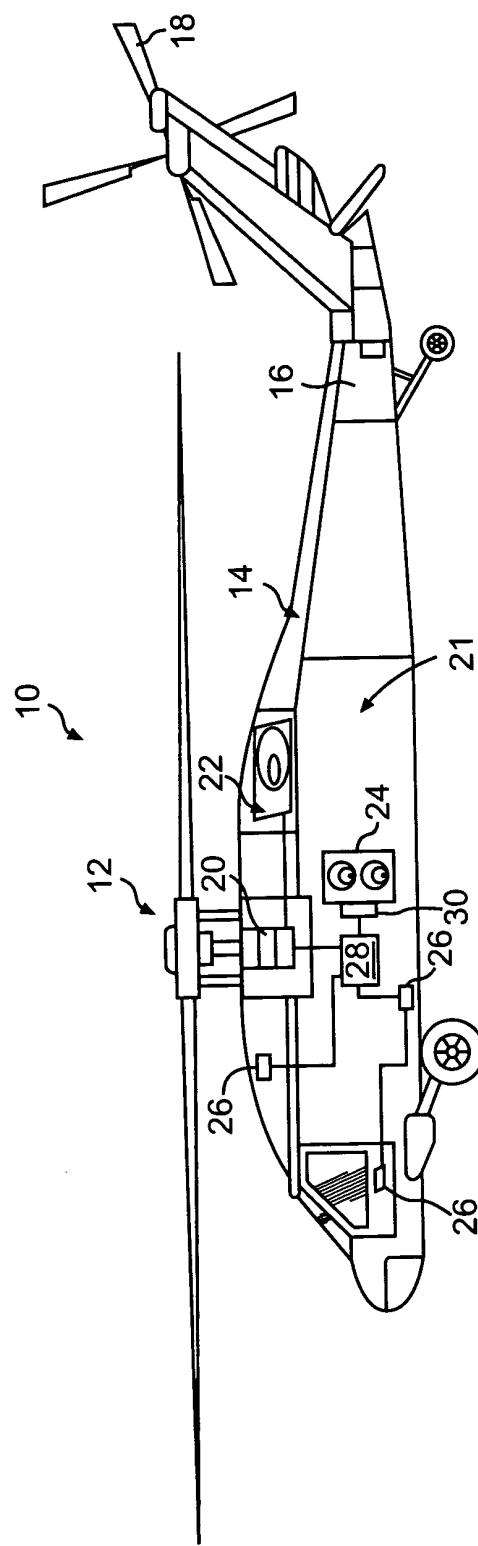


FIG. 1

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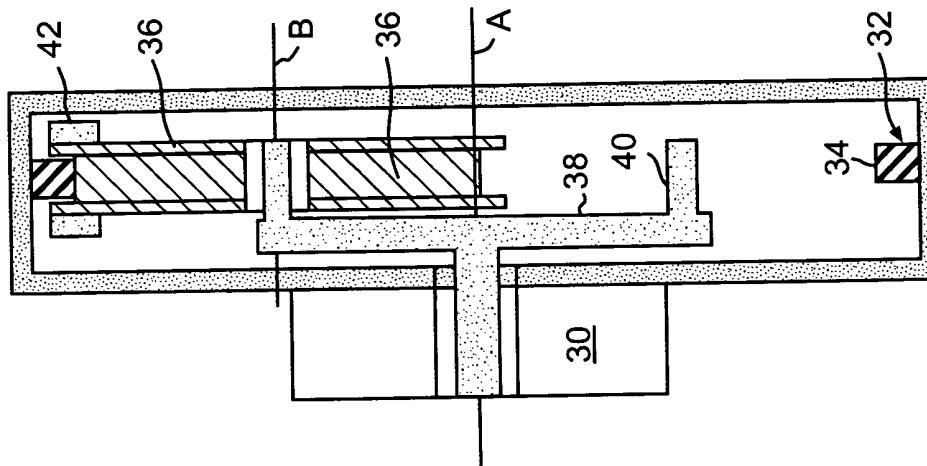


FIG. 2B

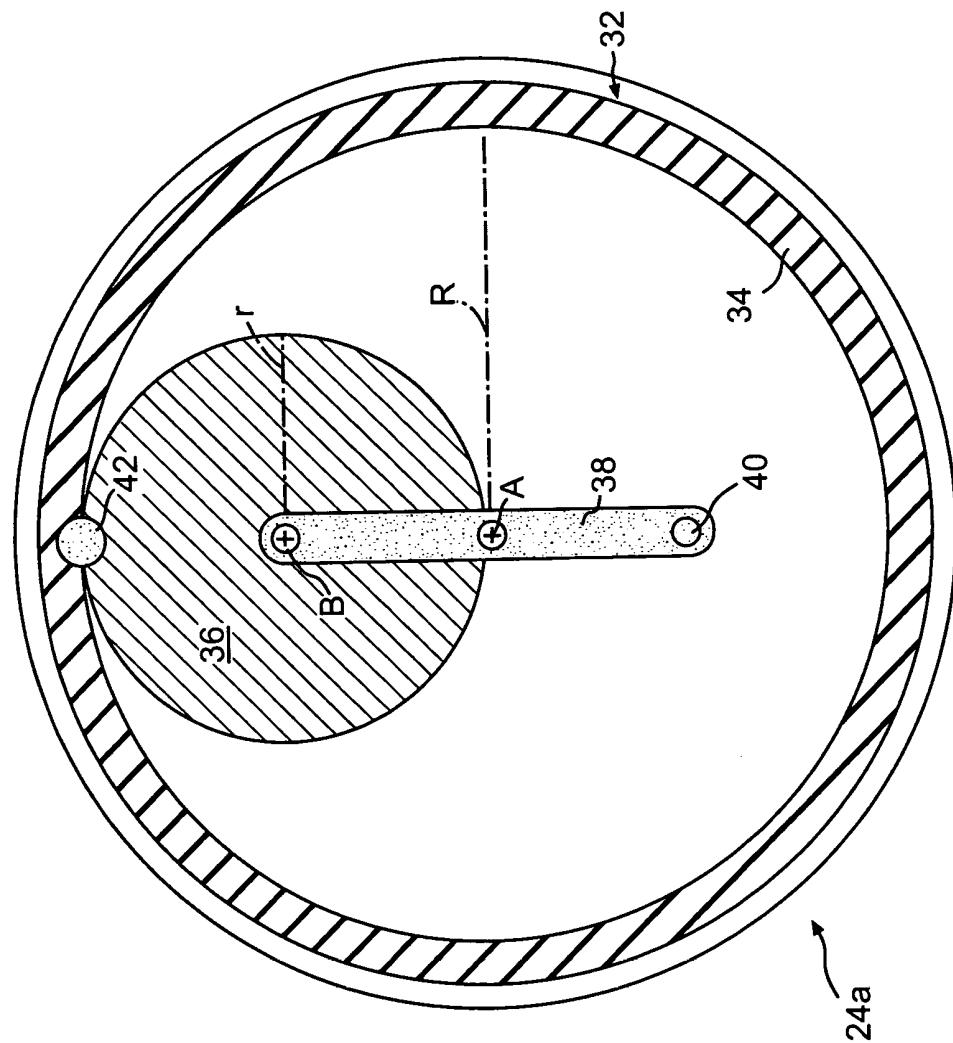


FIG. 2A

HARMONIC FORCE GENERATOR FOR AN ACTIVE VIBRATION CONTROL SYSTEM

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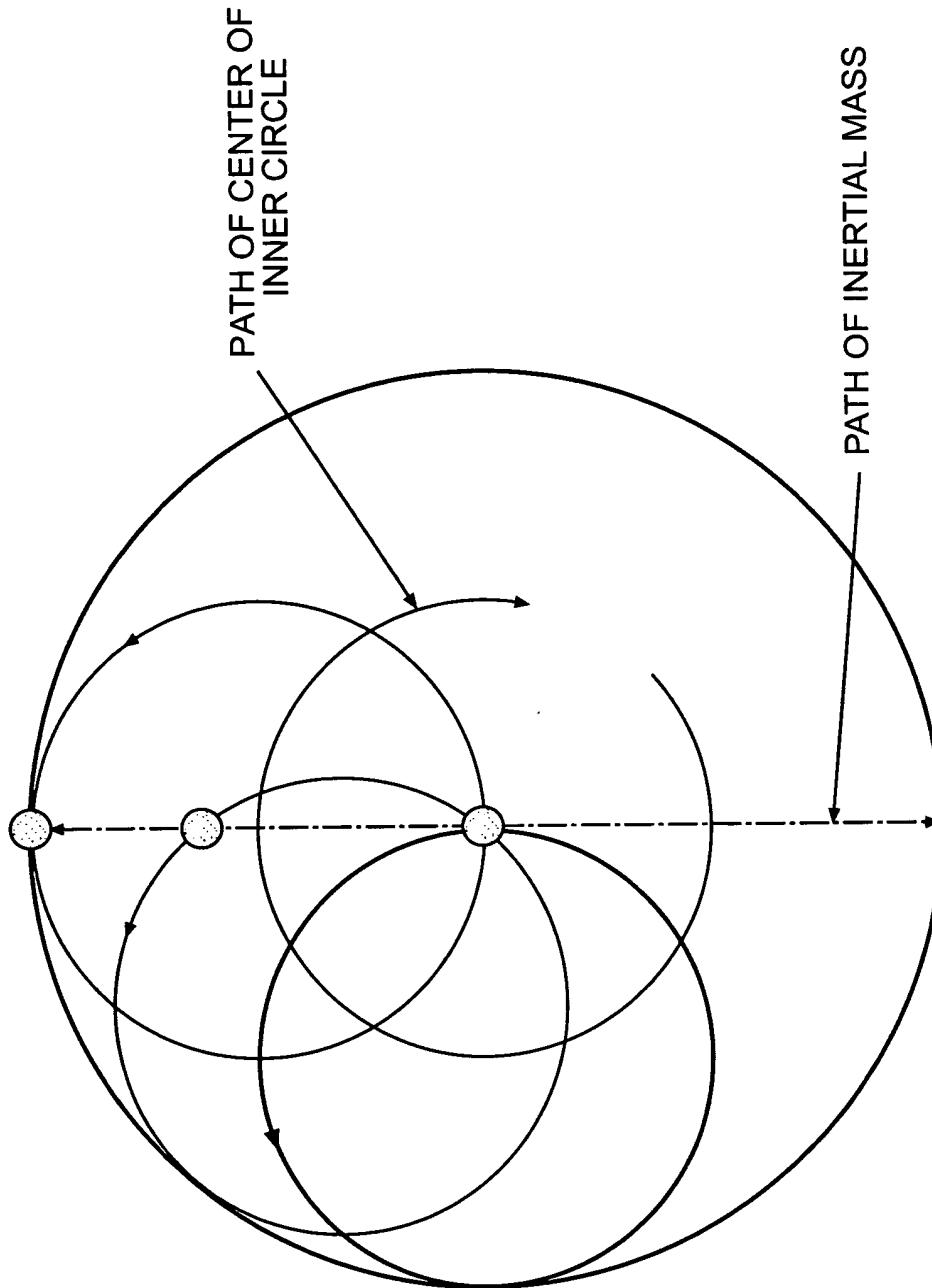
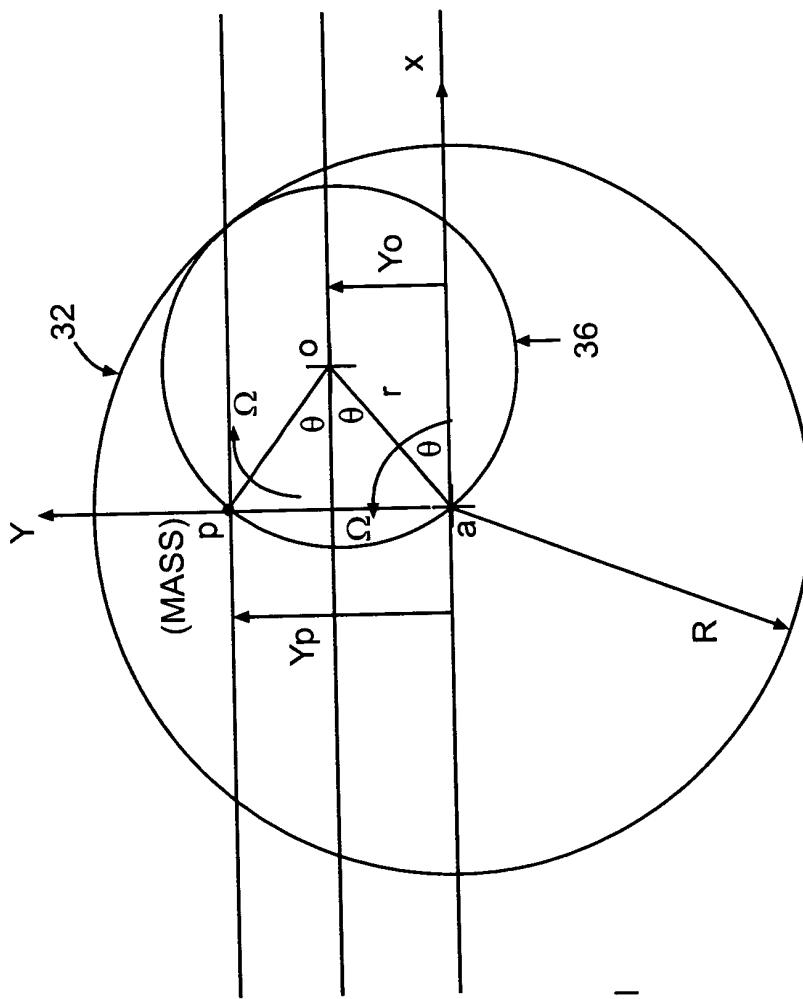


FIG. 3

HARMONIC FORCE GENERATOR FOR AN ACTIVE VIBRATION CONTROL SYSTEM

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IMPROVED HARMONIC FORCE GENERATOR
EQUATIONS OF MOTION

OUTER CIRCLE WITH CENTER a AND RADIUS R
INNER CIRCLE WITH CENTER o AND RADIUS r

$$R = 2r$$

CIRCUMFERENCE OF INNER CIRCLE:
 $c = 2\pi r$

CIRCUMFERENCE OF OUTER CIRCLE:
 $c = 2\pi R = 2c$

INNER CIRCLE ROLLS AROUND INSIDE THE
OUTER CIRCLE WITH ANGULAR VELOCITY Ω
AS INNER CIRCLE COMPLETES ONE ORBIT,
IT SIMULTANEOUSLY COMPLETES ONE
REVOLUTION ABOUT ITS CENTER.
THEREFORE THE ANGULAR VELOCITIES OF RADII
 a_0 AND o_0 ARE IDENTICAL.

POSITION OF POINT p ALONG Y AXIS:

$$y_0 = r \sin \theta = r \sin \Omega t$$

$$y_p = 2r \sin \Omega t$$

VELOCITY OF POINT p :

$$y_p (\text{dot}) = 2r\Omega \cos \Omega t$$

ACCELERATION OF POINT p :

$$y_p (\text{ddot}) = -2r\Omega^2 \sin \Omega t$$

INERTIAL FORCE GENERATED BY a MASS AT p :

$$F = ma$$

$$F = mR\Omega^2 \sin \Omega t$$

FIG. 4

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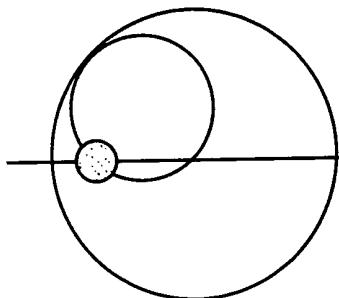


FIG. 5D

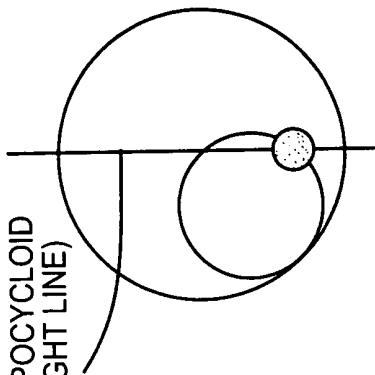


FIG. 5H

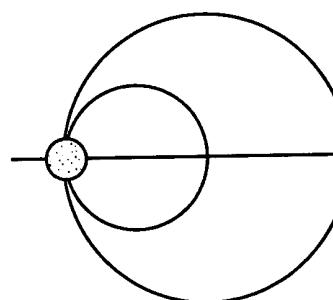


FIG. 5C

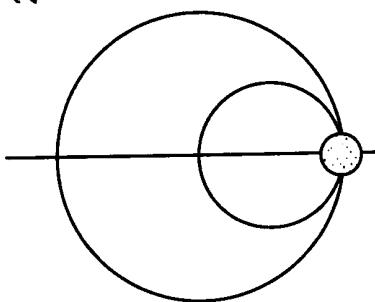


FIG. 5G

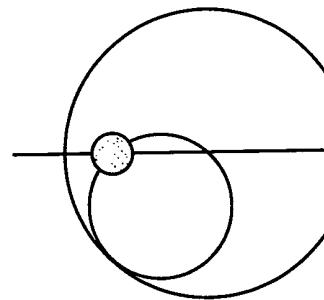


FIG. 5B

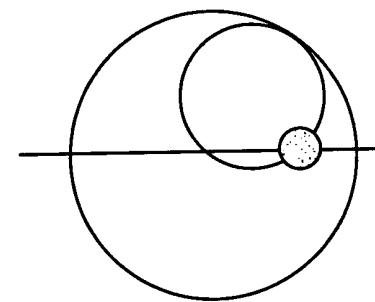


FIG. 5F

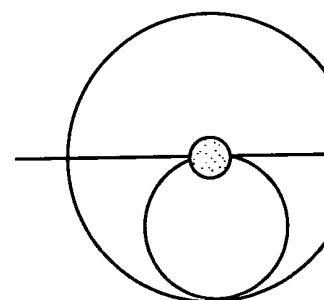
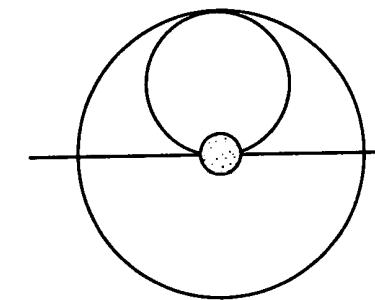


FIG. 5E



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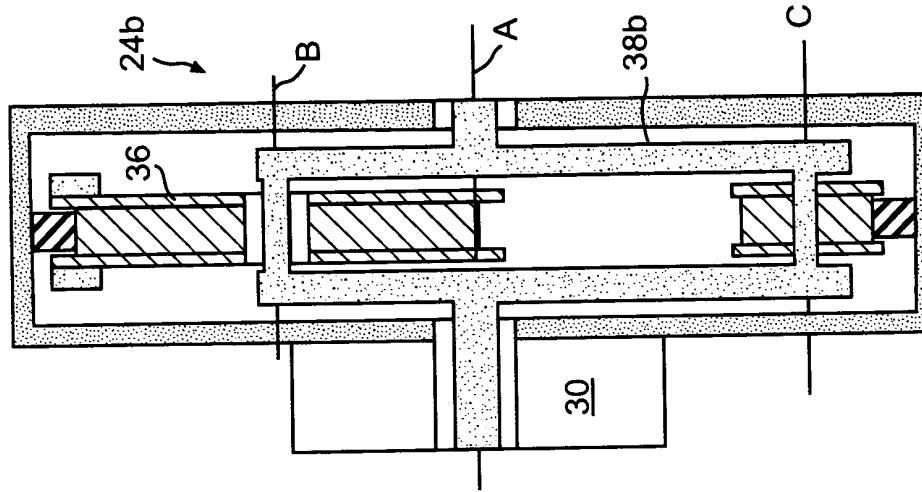


FIG. 6B

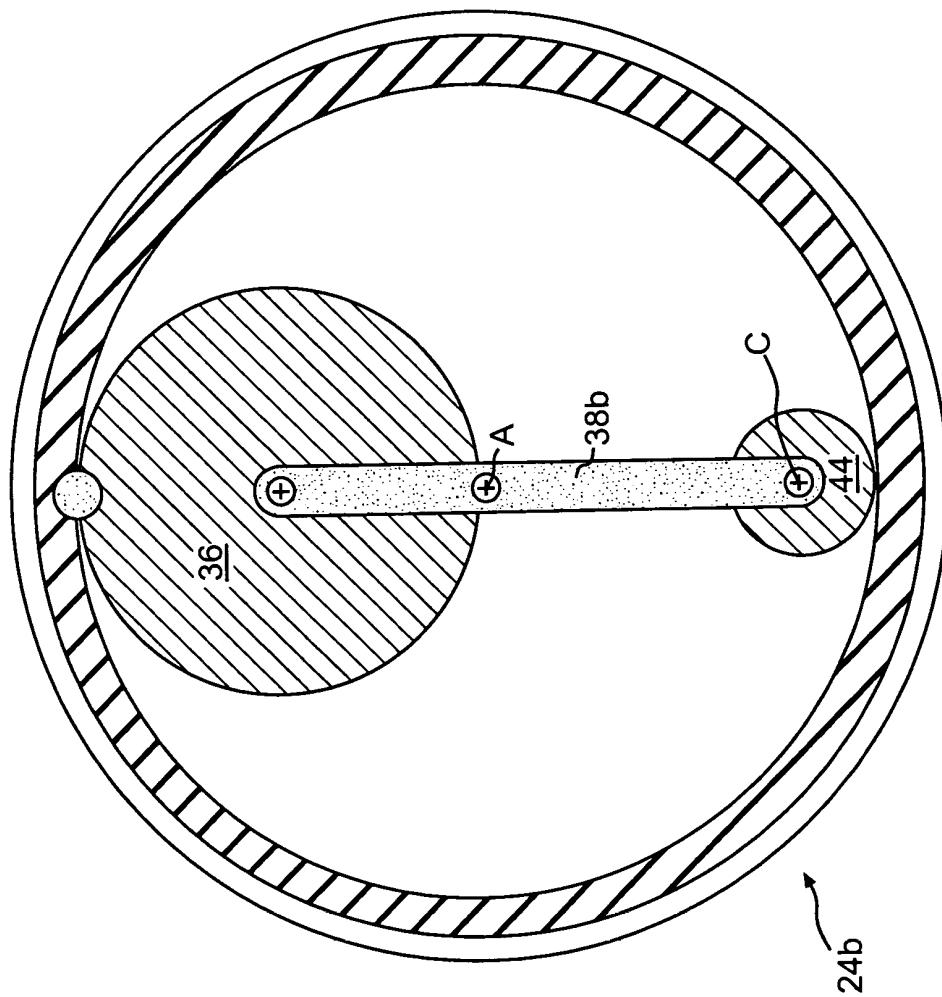
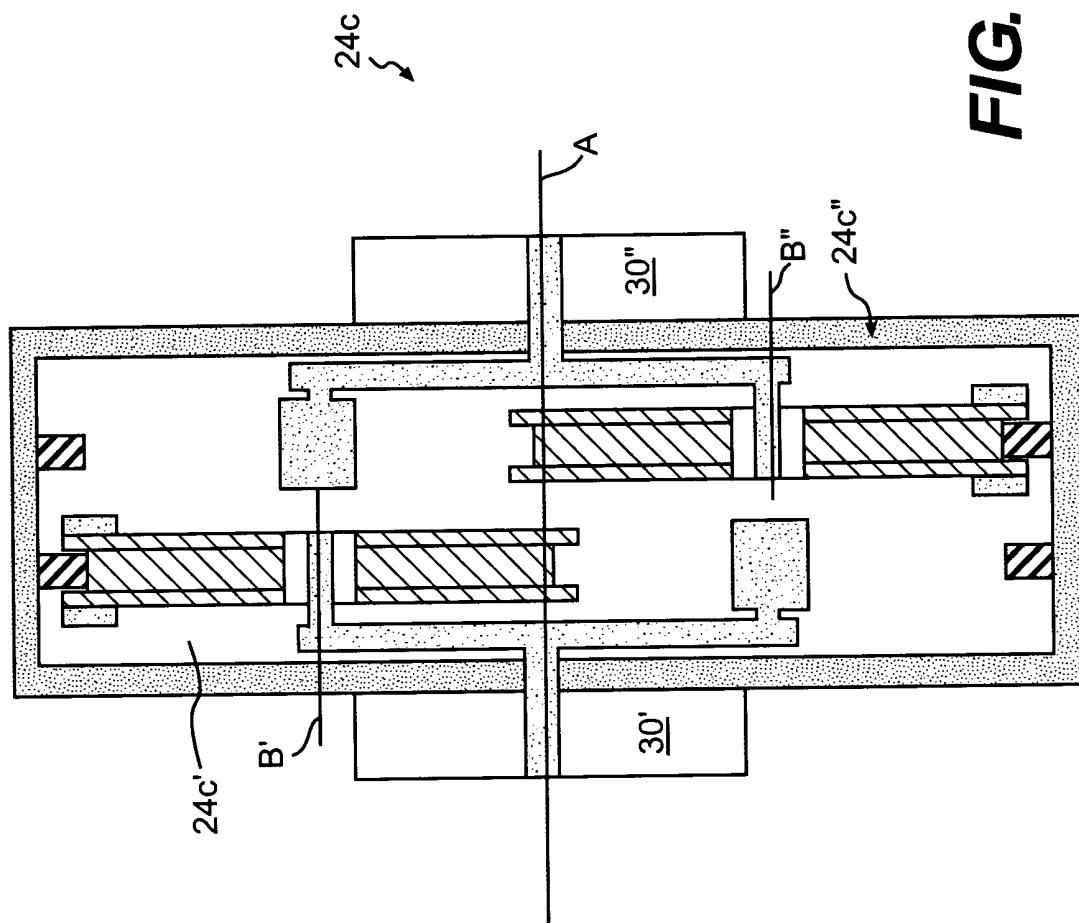


FIG. 6A

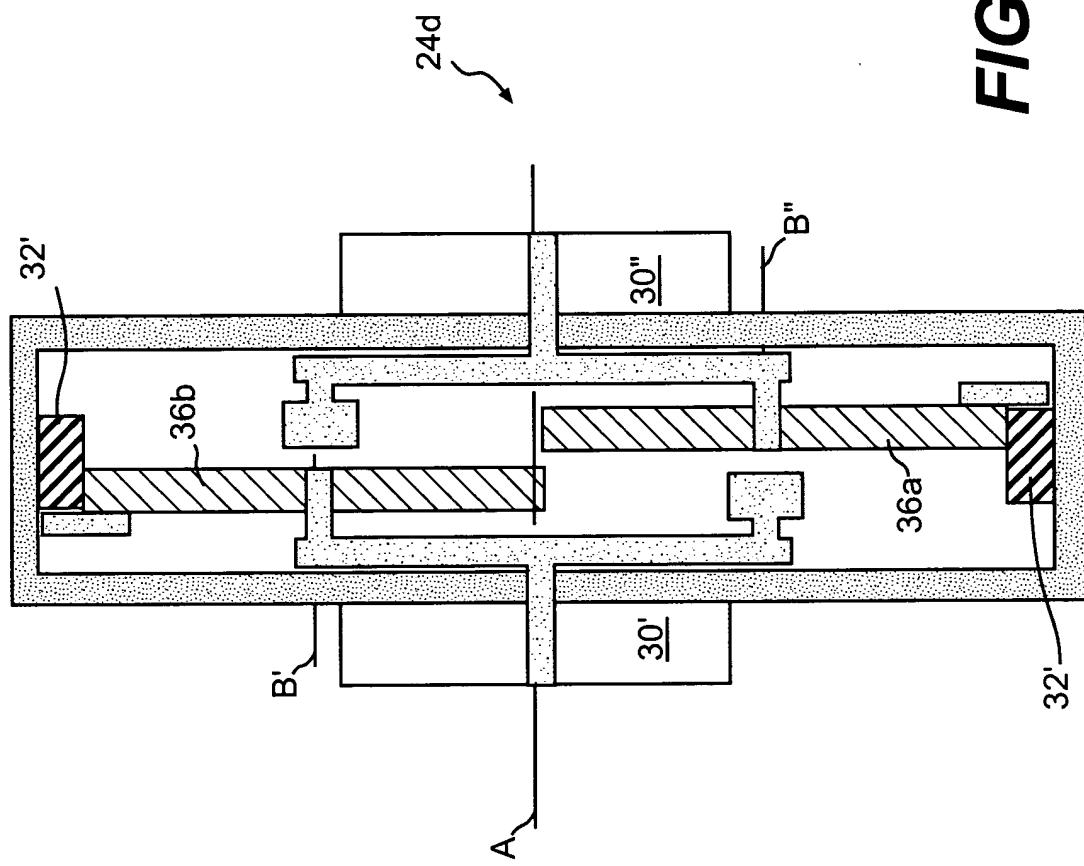
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FIG. 7



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FIG. 8



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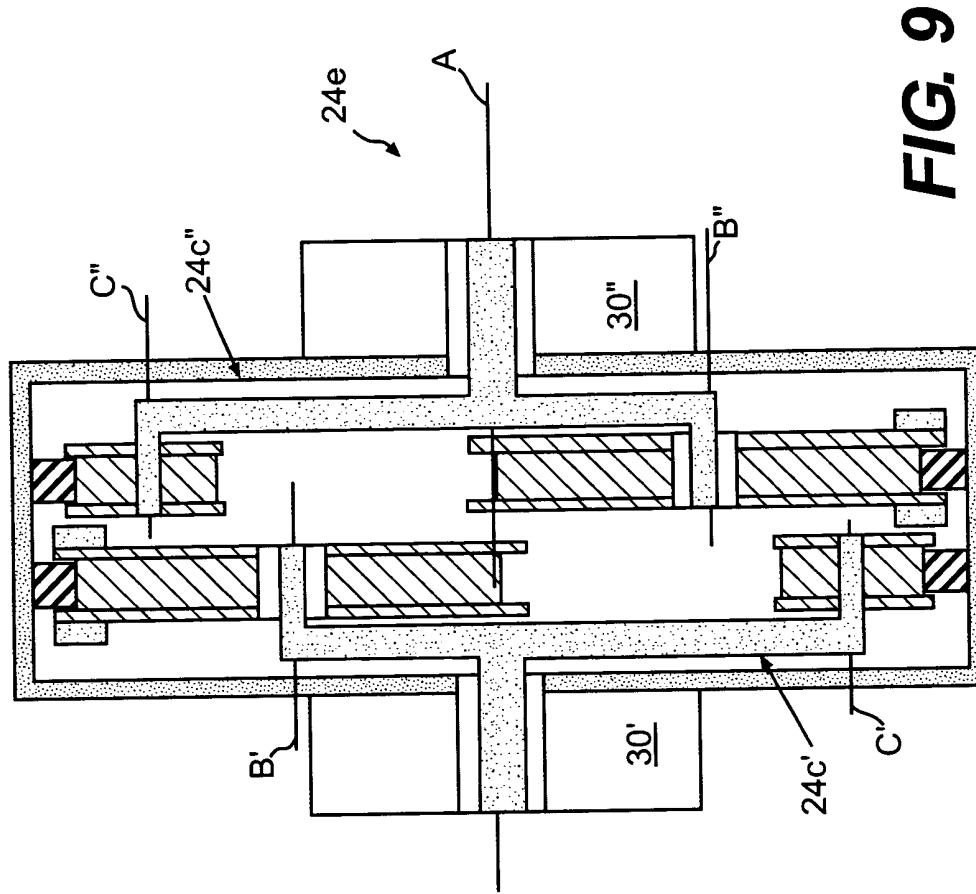
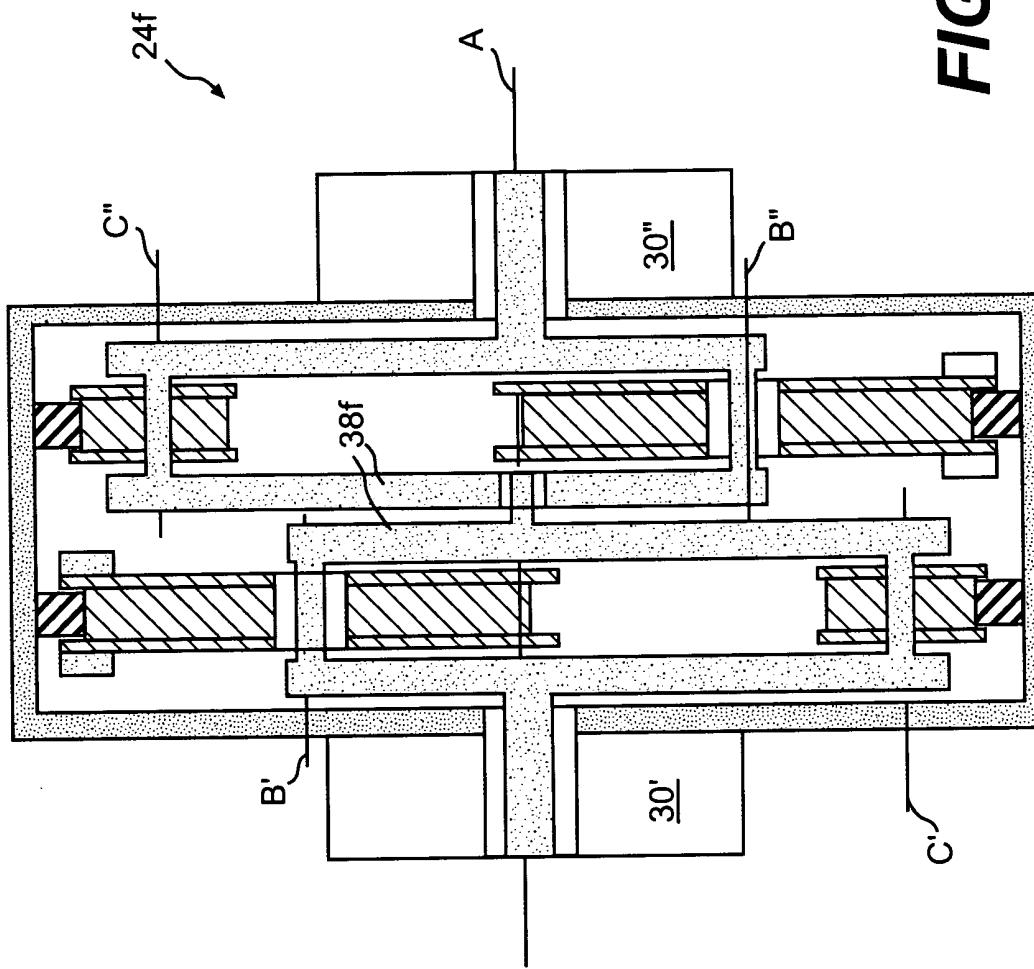


FIG. 9

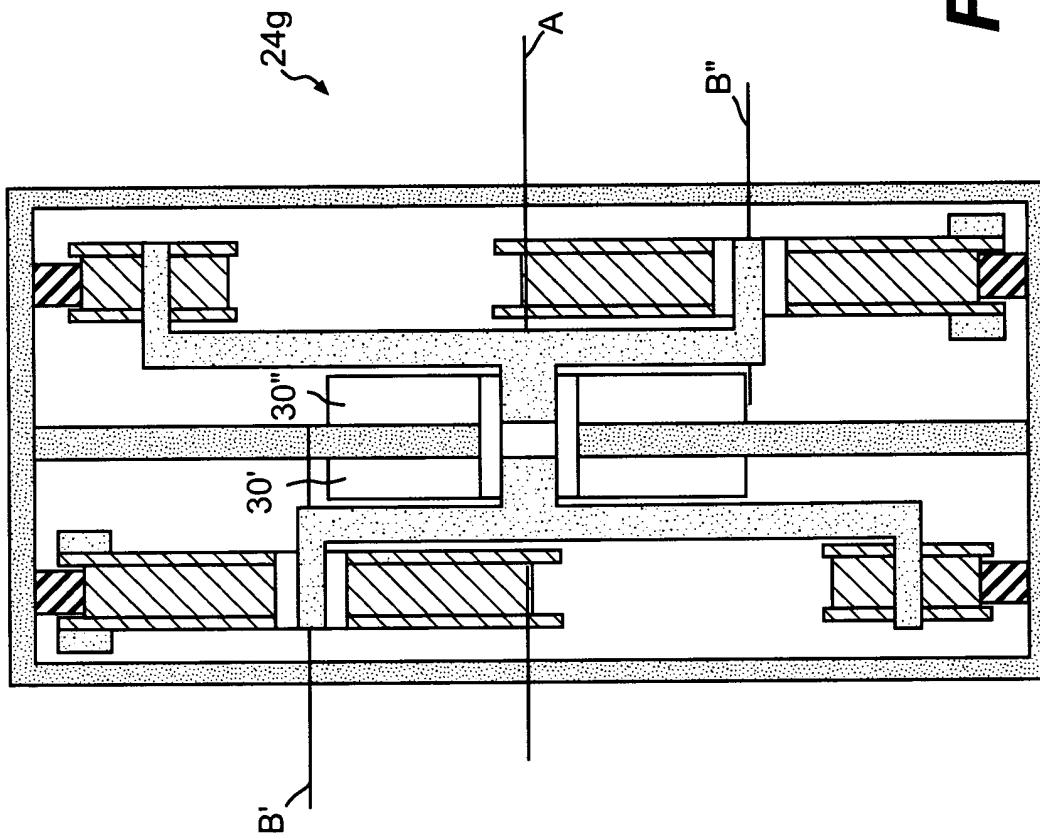
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FIG. 10



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FIG. 11



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FIG. 12

